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Subject: Application Serial No. 09/557,643
Docket No. 2129A
Applicant: Shulong Li
Filed: April 25, 2000
Title: "Low permeability airbag cushions
having extremely low coating levels"

Date: June 25, 2007

Copies:

Pages: 21 (including cover)

Comments:

Please find attached the following:

Brief on Appeal

- 20 pages

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Inventor(s): Shulong Li

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U.S. PTO Customer No. 25280
Case No.: 2129A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Shulong Li
Serial Number: 09/557,643
Filed: April 25, 2000
For: **Low Permeability Airbag Cushions Having Extremely Low Coating Levels**
Group Art Unit: 1771
Examiner: Singh, Arti. R.

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Date: June 25, 2007

Name: Linda-Ann Manley

Signature: *Linda-ann Manley*

BRIEF ON APPEAL UNDER 37 CFR § 41.37

Mail Stop Appeal Brief-Patents
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-14501

The following appeal brief is submitted pursuant to the Notice of Appeal filed on April 23, 2007 from the Final Action dated February 26, 2007. This brief is timely as filed on the first business day (Monday) following June 23, 2007.

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REAL PARTY IN INTEREST

The real party in interest is Milliken & Company, P.O. Box 1926, 920 Milliken Road, Spartanburg, South Carolina 29303 (Assignee).

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF CLAIMS

Claims 1-17 are pending and have been finally rejected. These claims are the subject of the instant appeal.

A copy of the current claims is attached hereto as the Claims Appendix.

STATUS OF AMENDMENTS

No amendments were submitted subsequent to final rejection.

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SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 is directed to a side curtain airbag cushion (26) illustrated in exemplary form in FIG. 2 designed to protect vehicle occupants during a rollover collision (page 4, line 15 through page 5, line 3). The cushion (26) is formed from a fabric (page 16, line 10 through page 17, line 1). The fabric has an outer surface and an inner surface in relation to the cushion. A film is laminated to at least one surface of the fabric (page 10, line 14 through page 11, line 10). The film is present on the surface of the fabric in an amount of at least 0.8 (page 19, line 2) and at most 2.7 (page 19, lines 9-11) ounces per square yard of the fabric. The film provides a substantially uniform laminated film layer on the surface of the fabric. The airbag cushion (26) exhibits a characteristic leak-down time after inflation of at least 5 seconds (page 7, line 20 through page 9, line 6).

Independent claim 10 is directed to a side curtain airbag cushion (26) illustrated in exemplary form in FIG. 2 designed to protect vehicle occupants during a rollover collision (page 4, line 15 through page 5, line 3). The cushion (26) is formed from a fabric (page 16, line 10 through page 17, line 1). The fabric has an outer surface and an inner surface in relation to the cushion. A film is laminated to at least one surface of the fabric in an amount of between at least 0.8 (page 19, line 2) and at most 2.7 (page

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19, lines 9-11) ounces per square yard of the fabric. The film provides a substantially uniform laminated film layer on the surface of the fabric. The film possesses a tensile strength of at least 2,000 psi and an elongation at break of at least 180% (page 10, lines 14-15). The airbag cushion (26) exhibits a characteristic leak-down time after inflation of at least 5 seconds (page 7, line 20 through page 9, line 6).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether or not claims 1-3, 8-11, and 16-17 are properly rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over United States patent 6,239,046 to Veiga et al..
2. Whether or not claims 1-17 are properly rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over United States patent 5,989,660 to Moriwaki et al.
3. Whether or not claims 1-17 are properly rejected under 35 U.S.C. 103(a) as obvious over United States patent 5,863,068 to Breed et al. in view of United States patent 5,989,660 to Moriwaki et al..

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ARGUMENT

A. Claims 1-3, 8-11, and 16-17 are not properly rejected under 35 U.S.C. 102(b) as being anticipated by, or obvious over United States patent 6,239,046 to Veiga et al..

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim. (MPEP § 2131). Appellant respectfully submits that Veiga et al. does not satisfy this rigorous standard with regard to the claims as presented. In this regard, each of the claims in the present application recites the feature of a substantially uniform laminated film layer on the surface of said fabric. Moreover, each claim calls for the airbag cushion to exhibit a characteristic leak-down time after inflation of at least 5 seconds as defined at page 7, line 20 through page 9, line 6. Independent claim 10 and claims depending therefrom contain the further limitations that the film possesses a tensile strength of at least 2,000 psi and an elongation at break of at least 180%. As best understood, such features are not taught by Veiga et al. and would not be inherent in the constructions of Veiga et al.

Veiga et al. appears to teach a traditional coated product rather than a film laminated product. The position of the Office Action appears to be that the polyurethane layer which is referred to in Veiga et al. as a prime coat or adhesive coat

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constitutes a film as presently claimed and that the coated product produced in Veiga et al. necessarily has the inherent characteristics recited in the claims. Appellant respectfully disagrees with both of these positions.

As regards the claimed feature of "a substantially uniform laminated film layer" Appellant respectfully notes that in Veiga et al. the polyurethane coating is applied across the porous fabric in a wet state and then dried (Col. 2, line 66). A fluid will collect preferentially in voids between yarns while leaving high spots where yarns cross with thinner coverage. Since the coating in Veiga et al. is applied in a wet state, there will necessarily be a substantial discontinuity in coating thickness across the fabric as the coating material flows into voids and interstices between yarns. This is particularly true in light of the relatively low coating weights used. Veiga's use of wet coating is analogous to applying wet paint to an irregular surface which results in different paint thicknesses in low spots and high spots. This may be contrasted to a laminated film as in the present invention which does not flow and which can deform to follow the contours of the substrate fabric while nonetheless retaining a substantially uniform thickness. Accordingly, it is respectfully submitted that the feature of "a substantially uniform laminated film layer" is inconsistent with the teachings of wet coatings in Veiga et al.

As regards the recital in each claim calling for the airbag cushion to exhibit a characteristic leak-down time after inflation of at least 5 seconds, the Office Action appears to be relying on a position that this characteristic would be inherent in the structure of Veiga et al. However, this position appears to be based on the erroneous

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assertion that the prior art product is the same as the presently claimed product. As pointed out above, this assertion is not correct since Veiga et al. is a coated product while the instantly claimed structure is a film laminated product. Thus, the products are not structurally identical.

Inherency cannot be based on the mere possibility that the claimed characteristic may be present in the cited art. Rather as noted at MPEP §2112(IV), "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). In the present case, it is respectfully submitted that there is a lack of sufficient evidence to support a conclusion of inherency. To the contrary, since the articles of the instant invention and the prior art utilize different constructions (a substantially uniform laminated film versus a wet applied coating) it is pure conjecture to assume that they will necessarily behave in the same manner.

Appellant respectfully submits that rejection of independent claim 10 and claims depending therefrom is in particular error. In this regard, claim 10 provides the further limitations that the film possesses a tensile strength of at least 2,000 psi and an elongation at break of at least 180%. As best understood, the Office Action has provided no evidence to support a position that such features are necessarily present in

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the wet applied coatings of Veiga et al. Thus, it is respectfully submitted that the inherency rejection should not be upheld.

As regards the alternative rejection of claims 1-3, 8-11 and 16-17, as being obvious, the Office Action notes that in a 102/103 rejection a claim may be rejected as obvious over teachings in a singular reference in the absence of teachings in that reference directed to claimed features and that a traditional Graham V. Deere analysis is not necessarily required. Appellant respectfully submits that while such rejections may be an available tool for use by an examiner, they are nonetheless limited in scope and predicated on the requirement that the products be substantially identical. Accordingly, it is inappropriate for the examining authority to ignore or discount structural differences in order to avoid the Graham V. Deere analysis.

In the present case it is respectfully submitted that the use of a laminated film in place of a wet applied coating in the prior art represents a structural difference in the final product since the laminated film provides a substantially uniform layer which would not be expected in the product of the cited art. Thus, it is respectfully submitted that a 102/103 rejection cannot be maintained. This is particularly true with respect to independent claim 10 and the claims depending therefrom which contain limitations that the film possesses a tensile strength of at least 2,000 psi and an elongation at break of at least 180%. As best understood, the Examiner has provided no evidence to support a position that such a film would be an obvious variant to the wet applied coatings of Veiga et al. Thus, it is respectfully submitted that the 102/103 rejection should not be upheld.

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B. Claims 1-17 are not properly rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over United States patent 5,989,660 to Moriwaki et al..

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as is contained in the claim. (MPEP § 2131). Appellant respectfully submits that Moriwaki et al. does not satisfy this rigorous standard with regard to the claims as presented. In this regard, each of the claims in the present application recites the feature of a substantially uniform laminated film layer on the surface of the fabric. Moreover, each claim calls for the airbag cushion to exhibit a characteristic leak-down time after inflation of at least 5 seconds as defined at page 7, line 20 through page 9, line 6. Independent claim 10 and claims depending therefrom contain the further limitations that the film possesses a tensile strength of at least 2,000 psi and an elongation at break of at least 180%. As best understood, such features are not taught by Moriwaki et al. and would not be inherent in the constructions of Moriwaki et al.

As best understood, Moriwaki et al. teaches an airbag fabric coated with a thermoplastic synthetic resin of 10 μm or less in average thickness. Moriwaki clearly teaches that the covering layer is adhered to a surface of the fibrous substrate such that interstices between the fibers are filled with the resin (Col. 2, lines 9-16). Appellant respectfully submits that such coating application is inconsistent with the recital in the

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present claims calling for a substantially uniform laminated film layer on the surface of the fabric. Moreover, Moriwaki et al. specifically teaches that the covering layer has an average thickness of 10 μm or less thus suggesting at least some degree of nonuniformity. In any event, it is respectfully submitted that the applied coating in Moriwaki et al. cannot be considered a laminated film. Accordingly, it is respectfully submitted that the feature of "a substantially uniform laminated film layer" is inconsistent with the teachings of Moriwaki et al.

As regards the recital in each claim calling for the airbag cushion to exhibit a characteristic leak-down time after inflation of at least 5 seconds, the Office Action appears to be relying on a position that this characteristic would be inherent in the structure of Moriwaki et al. However, this position appears to be based on the erroneous assertion that the prior art product is the same as the presently claimed product. As pointed out above, this assertion is not correct since Moriwaki et al. is a coated product while the instantly claimed structure is a film laminated product. Thus, the products are not structurally identical.

As noted previously, inherency cannot be based on the mere possibility that the claimed characteristic may be present in the cited art. Rather, "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49

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USPQ2d 1949, 1950-51 (Fed. Cir. 1999). In the present case, it is respectfully submitted that there is a lack of sufficient evidence to support a conclusion of inherency. To the contrary, since the articles of the instant invention and the prior art utilize different constructions (a substantially uniform laminated film versus a wet applied coating that flows between the fibers) it is pure conjecture to assume that they will necessarily behave in the same manner.

Appellant respectfully submits that rejection of independent claim 10 and claims depending therefrom is in particular error. In this regard, claim 10 provides the further limitations that the film possesses a tensile strength of at least 2,000 psi and an elongation at break of at least 180%. As best understood, the Office Action has provided no evidence to support a position that such features are necessarily present in the resin coatings of Moriwaki et al. Thus, it is respectfully submitted that the inherency rejection should not be upheld.

As regards the alternative rejection of claims 1-17 as being obvious under a 102/103 analysis. Appellant respectfully reiterates the position that a 102/103 rejection is properly limited in scope and predicated on the requirement that the products must be substantially identical. Accordingly, it is respectfully submitted that it is inappropriate for the Examining authority to ignore or discount structural differences in order to avoid the Graham V. Deere analysis.

In the present case, it is respectfully submitted that the use of a laminated film in place of a wet applied resin coating in the prior art represents a substantial and meaningful structural difference in the final product since the laminated film provides a

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substantially uniform layer which is not obtained in the product of the cited art. Thus, it is respectfully submitted that a 102/103 rejection cannot be maintained. This is particularly true with respect to independent claim 10 and the claims depending therefrom which contain limitations that the film possesses a tensile strength of at least 2,000 psi and an elongation at break of at least 180%. As best understood, the Office Action has provided no evidence to support a position that such film would be an obvious variant to the applied coatings of Moriwaki et al. Thus, it is respectfully submitted that the 102/103 rejection should not be upheld.

C. Claims 1-17 are not properly rejected under 35 U.S.C. 103(a) as obvious over United States patent 5,863,068 to Breed et al. in view of United States patent 5,989,660 to Moriwaki et al..

As best understood, Breed teaches the use of an inelastic film (316) laminated with fabric (314) to produce a hybrid airbag driver side airbag (300). See, Col. 18, lines 19-28. The inelastic character of the film is used to provide desired shaping. In the final rejection the Office Action has noted that FIG. 8 of Breed illustrates a side curtain airbag. The Office Action has also noted the teachings in Breed that many types of airbags may be formed using film on film or film on fabric constructions. Thus, as best understood, the position of the Examiner is that the teachings relating the film on fabric hybrid construction set forth at Col. 18 are equally applicable to construction of side curtain airbags. Appellant respectfully submits that even applying the Examiner's

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reasoning, the teachings of Breed as a whole weigh heavily against the conclusion of obviousness. In this regard, it is respectfully submitted that the specific teachings in Breed relating to the side protection bags illustrated in FIG. 8 of that reference must be considered.

Importantly, Breed specifically teaches against using a side protection airbag which remains inflated for extended periods. In fact, Breed specifically teaches that structures which retain inflation gas after deployment can cause sever neck injuries due to rebound and advocates using vents to avoid such injuries. See, Col. 21, lines 39-51 and Col. 22 lines 25-38.

As best understood, Breed also fails to teach or suggest the ability to use film weights within the claimed range of at least 0.8 and at most 2.7 ounces per square yard of the fabric. It is unclear what film thickness is advocated for use in the hybrid film over fabric construction of Breed. The reference discloses ranges for film airbags of less than about 250 micrometers and preferably below 100 micrometers with the caveat that thickness must increase with the size of the airbag. See Col. 5, lines 25 -30. Even at the lower level of 100 micrometers, this is still 10 times the upper limit of 10 μ m advocated for the low weight coating in Moriwaki et al. Moreover, Breed teaches that a traditional driver side fabric airbag has a thickness of about 400 micrometers. Thus, Breed appears to be advocating relatively thick and heavy films with the teaching that larger bags require thicker films. Accordingly, the lightweight film laminates of the present invention do not appear to be contemplated.

Finally, with regard to at least claim 10 and the claims depending therefrom,

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Breed provides a clear and unequivocal teaching of the desirability of using a relatively inelastic film in a hybrid film over fabric airbag to promote shaping. See, Col. 18, lines 26-28 ("The inelastic nature of the film causes this hybrid airbag 300 to form the proper shape for a driver airbag.") As best understood, the teachings of Breed indicate that materials with elongation prior to failure of greater than about 100% are considered elastomeric. See, Col. 9, lines 19-21 ("A plastic material is called an elastomer when its elongation prior to failure is large, sometimes as large as 100%, 200%, 400% or more.") Thus, elongation at break of at least 180% as required by independent claim 10 appears to represent a still further departure from the teachings of Breed.

Appellant respectfully submits that the teachings of the art must be considered in their entirety, including portions that would lead away from the claimed invention. See, MPEP §2141.02(VI). In the present case, the only reference cited that appears to use a film is Breed. However, Breed specifically teaches against the desirability of retaining gases for extended periods in side protection cushions and advocates the desirability of using substantially inelastic films. The presently claimed invention is in direct opposition to both of those express teachings. Accordingly, it is respectfully submitted that the outstanding rejection based on Breed as the primary reference should not be upheld.

CONCLUSION:

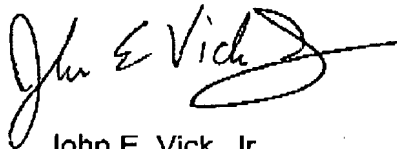
For the above reasons, Appellant respectfully requests the Board of Appeals to reverse the decision of the Office Action. In the event that there are additional fees

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associated with the submission of these papers, Applicant hereby authorizes the Commissioner to withdraw those fees from our Deposit Account No. 04-0500. Also, in the event that additional time is required to have the papers submitted herewith for the above referenced application to be considered timely, Applicant hereby petitions for any additional time required to make these papers timely and authorization is hereby granted to withdraw any additional fees necessary for this additional time from our Deposit Account No. 04-0500.

Respectfully Submitted,



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CLAIMS APPENDIX

1. A side curtain airbag cushion designed to protect vehicle occupants during a rollover collision, said cushion comprising a fabric exhibiting an outer surface and an inner surface in relation to said cushion, wherein a film is laminated to at least one of said outer surface and said inner surface of said fabric, wherein said film is present on said surface of said fabric in an amount of at least 0.8 and at most 2.7 ounces per square yard of the fabric, wherein said film provides a substantially uniform laminated film layer on said surface of said fabric; and wherein said airbag cushion exhibits a characteristic leak-down time after inflation of at least 5 seconds.
2. The airbag cushion of Claim 1 wherein said film is silicone free.
3. The airbag cushion of Claim 1 wherein said film composition comprises polyurethane.
4. The airbag cushion of Claim 1 wherein said coated fabric is woven from polyamide yarns.
5. The airbag cushion of Claim 4 wherein said polyamide yarns are formed from nylon 6,6 fiber.

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6. The airbag cushion of Claim 4, wherein said polyamide yarns are multifilament yarns exhibiting a linear density of about 210-630 denier.
7. The airbag cushion of Claim 6, wherein said multifilament yarns exhibit a filament linear density of about 7 denier per filament or less.
8. The airbag cushion of Claim 1 wherein said film is present on said airbag fabric surface in an amount of at most 2.5 ounces per square yard.
9. The airbag cushion of Claim 8 wherein said film is present on said airbag fabric in an amount of at most 2.2 ounces per square yard.
10. A side curtain airbag cushion designed to protect vehicle occupants during a rollover collision, said cushion comprising a fabric exhibiting an outer surface and an inner surface in relation to said cushion, wherein a film is laminated to at least one of said outer surface and said inner surface of said fabric, wherein said film is present on said surface of said fabric in an amount of between at least 0.8 and at most 2.7 ounces per square yard of the fabric, wherein said film provides a substantially uniform laminated film layer on said surface of said fabric; wherein said film possesses a tensile strength of at least 2,000 psi and an elongation at break of at least 180%; and wherein said airbag cushion exhibits a leak-down time after inflation of at least 5 seconds.
11. The airbag cushion of Claim 9 wherein said film comprises polyurethane.

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12. The airbag cushion of Claim 10 wherein said coated fabric is woven from polyamide yarns.

13. The airbag cushion of Claim 11 wherein said polyamide yarns are formed from nylon 6,6 fiber.

14. The airbag cushion of Claim 12, wherein said polyamide yarns are multifilament exhibiting a linear density of about 210-630 denier.

15. The airbag cushion of Claim 13, wherein said multifilament yarns exhibit a filament linear density of about 7 denier per filament or less.

16. The airbag cushion of Claim 10 wherein said film is present on said airbag fabric surface in an amount of at most 2.5 ounces per square yard.

17. The airbag cushion of Claim 16 wherein said film is present coated on said airbag fabric surface in an amount of at most 2.2 ounces per square yard.

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EVIDENCE APPENDIX

None

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RELATED PROCEEDINGS APPENDIX

None